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Visceral Leishmaniasis (Kala-azar) in Merti Sub-County, Isiolo County: a case of socio-cultural challenges

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ABSTRACT

Introduction: Visceral Leishmaniasis (VL) also known as Kala-azar is a fatal neglected tropical disease (NTD) with a 95% fatality rate among untreated cases. Although there is little information available about the disease's prevalence in Isiolo County, it is extremely endemic in a number of villages in Merti Sub-County.

Case Presentation: In this case presentation, a family of three children resulted to traditional therapy when the children contracted Kala-azar. All the three children exhibited signs of fever, loss of appetite, swollen abdomen, vomiting, and general weakness.

Discussion: Low levels of Visceral Leishmaniasis knowledge, ignorance characterized by cultural beliefs, and the use of local therapies are among socio-cultural challenges impeding implementation of effective Kala-azar control strategies in Isiolo County.

Conclusion: This case highlights the importance of focused community awareness for prompt and efficient diagnosis and treatment to lower Kala-azar prevalence, monitoring the burden and spread of the disease as well as lowering transmission.

Introduction

Visceral Leishmaniasis (Kala-azar) is a disease caused by Leishmania species that affects human. Transmission is through the bite of Phlebotomus sandflies. Globally, WHO ranks Kala-azar as the second largest parasitic killer after Malaria. Approximately 90% of Kala-azar global burden is found in Africa (Wamai et al., 2020). Data from the Ministry of Health indicates that about 5 million people mainly children under five years are at risk of Kala-azar. The disease which mostly affects poor communities is often associated with poverty, poor housing, population displacement, weak immune system, and malnutrition. Today, about 30 sub-counties in Kenya still struggle with Leishmaniasis making the disease as of great public health importance. These sub-counties extend over the arid zones of the seven majorly affected counties in the country (Kanyina, 2020).

The exact status of the problem in Isiolo County is unstated because of low community awareness, inaccessibility of health facilities, and dis-

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ease diagnostic challenges. High levels of poverty, poor infrastructures, periodic famine, drought, and the rural nature of the disease makes it difficult to implement the Kala-azar prevention and control measures in the County. Increased mortality and morbidity from the disease are attributable to low index of suspicion by health care workers, late diagnosis, and case management. Merti and Garbatulla sub-counties are Kala-azar hotspots in Isiolo County however critical epidemiological information on the disease are not well documented. This study key informants' interviews to identify challenges affecting surveillance and control measures, cited major challenges to include diagnostic test kits not available at the health facilities, drugs not available at the health facilities, diagnosis of Kala-azar not correctly done at the health facilities, and doctors not available at the health facilities. Other challenges mentioned by the study informants included lack of community awareness, minimal community engagement, and lack of resources for effective vector control measures. The mentioned challenges hinder effective surveillance and control of Kala-azar in Isiolo County leading to underreporting of cases, delayed or inaccurate diagnosis hence missed cases, inaccurate disease mapping and control measures, increased transmissions, and poor treatment outcomes.

Delayed treatment or access to inappropriate medication can lead to complications and fatalities (Wamai et al., 2020). The nature of the current treatment regimen and their toxic effects, restricts the disease treatment to health facilities with its effects felt at both county and sub-county levels. Additionally, because the drugs are expensive, Leishmaniasis treatment is not easily accessible in most health facilities (DNDi, 2022). This is reflected in the case of one family from Mataarba sub-location in Merti sub-county, Isiolo county, Kenya. This case report highlights the community's perception of the disease and reaction to diagnosis.

Case Presentation

This study reports a case where a family of three children from Mataarba sub-location in Merti sub-county resulted to traditional therapy when three of their children contracted Kala-azar. The first child was infected with Kala-azar at the age of one year nine months, second child at the age of one year five months and the third child at the tender age of one year one month. The children's age depicts effects of socio-cultural factors exerting influence on spacing and timing of child births in the region where closely spaced and early pregnancies are common. According to the children's grandmother who was their caretaker during infection time, the first two children exhibited signs of fever, night sweats, loss of appetite, swollen abdomen, vomiting, and general weakness.

The children were in custody of their grandmother because their mother was expectant for the third child, therefore not in a position to handle these children, especially through the sickness period. The first child (one year, nine months old girl) started experiencing diarrhoea, fever, loss of appetite, swollen abdomen, vomiting, weight loss, and general body weakness. The second child (one year, five months old boy) experienced similar symptoms as the girl but had increased episodes of vomiting and irregular bouts of fever. The first two children were taken to a traditional healer. The third child (one year, one month old boy) on admission at the Isiolo County Teaching and Referral Hospital (ICTRH), the triage nurse noted the patient's information which included the name of the child, age, year of birth, gender, Ward, Village, nearest health facility, name of the contact person and the mobile contact. At presentation phase, the child had a weight of 9 kg, height 75 cm, and temperature of 38.5 °C. This was the 14th day since onset of disease symptoms. The name of the village where this child probably got infected was Mataarba since the family did not have history of travel to other endemic areas (in the County). The child had not been taken to a traditional healer before visiting the health facility unlike the first two children and

had never been admitted in a hospital due to Visceral Leishmaniasis before.

On physical examination, the child had fever that had lasted two weeks. This acute fever was mainly experienced in the evenings with resultant night sweats. The child had abdominal distension and upon performing spleen and liver palpation, the spleen was slightly enlarged. There was no presence of concomitant infections at presentation. Laboratory examination results were as follows: HIV Status = Negative, Rapid diagnostic test (rK39) = Positive, and Haemoglobin level (g/dL) = 9 gm/dl. Final diagnosis/patient category was Primary VL after performing Rapid Diagnostic Test (RDT). This child was therefore hospitalized for Leishmaniasis treatment.

Management and Outcome

The first two children condition affected their grandmother psychologically who therefore decided to seek for treatment from a traditional healer because of her cultural beliefs. The children's mother could not make decisions because she was not with the children at that time. The family's social economic situation, distance from the health facility were not a problem for the family. The family's home was less than 2 kilometers from the nearest health facility, Mataarba Dispensary. However, cultural beliefs and fear of the current Kala-azar treatment regimen adverse effects deterred the grandmother from taking these children to the health facility for Leishmaniasis treatment. According to the family, risks involved if they sought treatment at the dispensary outweighed the positive outcomes, they could have attained by visiting a traditional healer for treatment. She therefore took the first two children (girl and boy) to a traditional healer for treatment. Figure 1 shows the image of the second child's abdomen which had burn scars from the traditional healers' therapeutic burns.

The community has cultural beliefs on the effectiveness of 'heat therapy' when applied during early stages of Kala-azar disease. The community have a belief that heat applied on the abdomen around the spleen area aids in elimination of excess water which is accumulated in the spleen causing abdomen distension. When the third child contracted Kala-azar at the age of one year one month, the severity of the child's sickness prompted her mother to seek immediate medical attention at the nearest health facility which was Mataarba Dispensary.

At the health facility, the child was prescribed with analgesics for reducing fever and antimalarial drugs. The child's condition worsened prompting the mother's return to the health facility a week later for further examination. The clinician at the health facility recommended Rapid Diagnostic Test (RDT) for Kala-azar, sadly there were no diagnostic testing kits at the health facility, and therefore the child was referred to Merti Health Centre which is 20 kilometers away for diagnosis. Interestingly, even at this health facility, testing kits were out of stock and the child was transferred for a second time to Isiolo County Teaching and Referral Hospital (ICTRH) which is 189 kilometers away. After arrival and performing laboratory examinations at ICTRH, the results were positive for Kala-azar and the child was immediately admitted to start Kala-azar treatment. The mother was hesitant of the hospitalization initially but clinicians at the facility counselled her on the importance of early Leishmaniasis treatment. The mother's primary concern was the effects of the treatment. However, the clinician assured her that the hospital had the best treatment option for the child. The clinician prescribed treatment regimen of a combination of sodium stibogluconate (SSG) + Paromomycin for 17 treatment days. The treatment was completed, and the initial treatment outcome was initial cure. During the child's two weeks stay at the hospital, there were no reported severe adverse effects of the drugs used with no other condition treated during the initial VL treatment. The child's fever subsided after the treatment, and his general health showed a noticeable improvement. Finally, the child was discharged upon completion of treatment and referred to Mataarba Dispensary for re-

view after six weeks. The mother was advised to return back to Isiolo County Teaching and Referral Hospital (ICTRH) after six months for follow up examination. The six (6) months follow up examinations results indicated the final treatment outcome as final (definitive) cure with no signs and symptoms of Post Kala-azar Dermal Leishmaniasis (PKDL) which is a well-known complication of Kala-azar. The mother's insecurities were not without reasons, Ministry of Health Kenya reports of severe side effects of Leishmanisisis treatment and the burden on the health facilities.

Current treatment regimen has drugs associated serious side effects including pancreatitis, hepatotoxicity, and cardiotoxicity. The treatment plan is also hard to administer to cases who must endure two painful injections daily for seventeen days. Drugs for Neglected Disease Initiative (DNDi) and its partners however brought hope for Kala-azar cases in 2022 with the positive results of a clinical trial research on new Leishmaniasis oral treatments. The new treatment for Kala-azar when introduced will reduce the number of daily painful and toxic injections.

The new treatment will consist of a combination of two drugs: Paromomycin which is an antibiotic injection that is 91% effective and Miltefosine the only oral drug available for Kala-azar treatment. Kenya's Ministry of Health is hopeful that this will bring down the Kala-azar morbidity by 60% before the year 2025. The new drugs are safer and will also decrease hospitalization time which troubles families a lot. The current treatment plan has a considerable social economic impact as patients are forced to stay at the health facilities for extended periods of time during the treatment. Community's life is disturbed by having to stay in the hospital since they are unable to concentrate in taking care of their homes which must be abandoned or delegated to other family members just like the case of the Mataarba's family.

Having taken the third child to the hospital for Kala-azar treatment and management, the Mataarba's family observed the treatment regimen which enabled the child to recover fully from the disease. The family now has the belief that Kala-azar can be completely cured if the diagnosis is done early enough and correctly, and treatment completed. The sub-location lost two children in the month of September 2023 who suffered from Kala-azar and community members do not wish a repeat of the same according to one of the key respondents. Through the Merti Sub-County Ward Planning Committee (WPC) and the Mataarba Village Community Conversation (CC) Group, they have developed community action plans to engage the County and all other relevant stakeholders with efforts towards elimination of Kala-azar in the sub-location focusing on effective case management, integrated vector management, and social mobilisation.

Discussion

According to WHO, Visceral Leishmaniasis (VL) also known as Kala-azar is the most severe form of Leishmaniasis and the second largest parasitic killer after malaria. The disease's clinical appearance makes it easy to confuse with other hematological, neoplastic, autoimmune, or other disorders of different etiologies. When underlying illnesses are present, Kala-azar could be mistakenly identified as the advancement of an already-existing ailment. Hence, in order to prevent misdiagnosis or delays in diagnosis, as occurred with our case from Mataarba, clinicians working in endemic areas like Merti should be aware of this infection for correct and early diagnosis.

Kala-azar mostly affects a subset of communities considered the poor of the poorest. Sociocultural challenges including low levels of Visceral Leishmaniasis community awareness, misinformation characterized by the cultural beliefs, and use of traditional remedies are some of the major challenges in the elimination of Kala-azar as a public health problem in Isiolo County. These sociocultural challenges resulted in the first two children being taken to a traditional healer for treatment. Restrictions on the mother's decision-

making authority is also a limitation barrier to the children access to the hospital. This case report observed that mothers are at a disadvantage when a family member is suspected of having Kala -azar, even though it is the responsibility of both parents to make the decision. It is required of the women to manage childcare, domestic chores, and look after livestock.

According to cultural norms, consent from husbands or other male family members is necessary before taking children to hospitals. These cultural beliefs contribute to delayed health seeking behaviour among the community that have profound effects on treatment outcomes and disease prognosis. When combined, these obstacles cause a protracted lag between development of symptoms and treatment, making it more difficult to manage Visceral Leishmaniasis cases thereby decreasing likelihood that treatments will be successful. This was majorly observed in Mataarba's family poor health seeking behaviour which is also exhibited by the community as well as low community awareness on Kala-azar in most areas.

Early detection and treatment are a critical element in averting fatalities and decreasing the disease burden. However, this is a major challenge mainly in remote, rural, and poor settings and areas with political instability, conflict, population movements, and climate change impacts (Wamai et al., 2020).

Figure 1: *Traditional treatment of Visceral Leishmaniasis through heat therapy*

Figure 2: *Seasonal variations of Kala-azar Incident rates from 2021 to 2023 as obtained from Merti Health Centre monthly records*

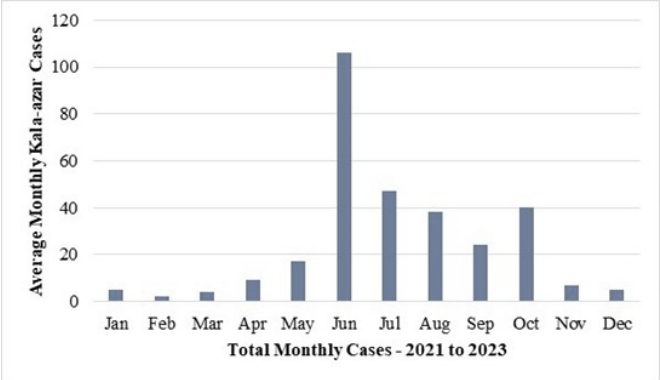

Figure 2 shows the number of Visceral Leishmaniasis cases treated at Merti Health Centre per month from 2021 to 2023 years as obtained from the health centre records. Notably, the annual Kala-azar cases treated at Merti Health Centre tend to have increased from between June to October, which are dry seasons in the County. Our three cases were also reported during the dry seasons when the mother relocated with the young children in search of forage for her livestock. This is the season when sandflies are also abundant breeding in the cracks and crevices on the ground increasing their exposure to the vector, and transmission.

These results are consistent with research findings of a study conducted by Abdullahi et al. (2022) on climate change and environmental influence on Kala-azar in West Pokot County which reported a surge of Kala-azar cases during the dry seasons and just after the rains when the region experienced high humidity. These findings corroborate earlier reports and further attribute the rise in Kala-azar cases during the dry season to elevated vector populations and vector expansion to uncommon areas towards the end of dry seasons, which are typically characterized by high humidity and wider temperature variations. Similar to this, prolonged customary drought conditions brought on by climate change cause pasture coverage to

diminish, which in turn leads to increased migration of people and animals further into rangeland sections with high vector densities in search of pasture and browsing material for their livestock. This migration exposes people to vector bites, as reported in earlier studies (Abdullahi et al., 2022).

In 2023 alone, approximately 147 cases tested positive for Kala-azar in Merti Health Centre. Unfortunately, this is the only health facility in the sub-county with laboratory facilities for the testing and diagnosis of Visceral Leishmaniasis. According to DHIS2, additional 39 cases were treated as inpatients in Isiolo County Teaching and Referral Hospital (ICTRH), which ideally is many kilometers from Merti (189kms), and therefore only a few people have the capability of reaching the teaching and referral hospital to get more specialized laboratory diagnosis and treatment for the disease.

Long travel times to medical facilities for diagnosis and treatment lead to difficulties with treatment monitoring and detection delays as evidenced in our case.

Leishmaniasis has remained a public health issue despite the different steps taken by the Ministry of Health within most parts of Isiolo County with our case Mataarba village in Merti sub-county being among the Kala-azar endemic villages. Inconsistences in reporting cases (quality of data) is a huge factor linked to the frequent and persistent outbreaks. This has led to challenges in the generation and use of strategic and accurate information to aid decision making (Alvar et al., 2021).

Neglected tropical diseases (NTDs) are various classes of communicable diseases that exist in tropical and sub-tropical conditions affecting hundreds of thousands of people globally. Increased prevalence of NTD's is often recorded majorly amongst poverty-stricken communities, those in close contact with livestock and domestic animals, those living in areas infested by infectious vectors, and those without adequate sanitation (Dijk et al., 2023). These diseases and the people they affect are usually overlooked by policy makers with very little resources allocated to address them. There is no easy solution to large number of these diseases with diagnosis and treatment being difficult or simply not accessible on most occasions. A practical example is our case of Merti Health Centre in this report which has erratic supply of Kala-azar diagnostic kits. Chronic poverty and neglected tropical diseases results in prolonged disability which often leads to death (den Boer, 2021).

While the WHO roadmap for NTDs 2021-2030 includes Kala-azar elimination as a public health problem, to achieve elimination, however, a variety of interconnected problems must be overcome, such as those relating to socio-cultural, the healthcare system, political, climate change, little or no vector control, drugs, and diagnostics, epidemiological, and research. If the 2030 Kala-azar eradication targets are to be met, it is imperative to address the above issues and how they relate to one another (Makau-barasa et al., 2022).The socio-cultural challenges comprise use of local remedies, stigma, misinformation associated with traditional beliefs, and low levels of Kala-azar awareness. These challenges affect the disease prognosis and treatment outcomes because they lead to late health seeking behaviour in the Kala-azar endemic regions. The case that is being discussed here involves Mataarba community in Merti sub-county which was under such challenges of low community awareness of the disease and cultural beliefs which resulted in poor health seeking behaviour from the community. Furthermore, research on unique ideas regarding cause of Kala-azar in impacted populations is lacking, even though this knowledge is crucial for creating appropriate public health communication strategies for Kala-azar early detection and health-seeking behavior (Makau-barasa et al., 2022).

Sadly, patients must travel for more than 10 kilometers to receive care in sparsely populated, geographically wide areas where there are few health facilities equipped to diagnose and treat Kala-azar (de Souza et al., 2022). Another issue with the health system is the lack of competent

health care workers and their high turnover rate. The WHO-CHOICE health economics Geo Access work defines access as a 2-hour walk (8 km in rural regions, 10-km in urban areas) (Ramanathan et al., 2020).

According to this study's findings, Kala-azar affects the poor populations living in areas with poor healthcare infrastructure. Long hospital stays, numerous laboratory testing to confirm the diagnosis, and patient follow-up are all necessary for Kala-azar diagnosis and treatment. This is not just expensive for the affected persons but challenging in the absence of effective healthcare systems (Makau-Barasa et al., 2022). In the instance at hand, the community in Mataarba sub-location reported experiencing similar challenges, which were inadequate and delays in the supply of diagnostic kits and drugs to Mataarba Dispensary, staff shortage and lack of training on Kala-azar case management, and poor diagnosis of Kala-azar in the health facility. These must be addressed by the County Government to enhance prevention, diagnosis and treatment of Visceral Leishmaniasis in Isiolo County.

Conclusion

The case report given illustrates the sociocultural challenges in the management of Visceral Leishmaniasis which nearly usually causes mortality if left misdiagnosed and untreated. These challenges result in late health seeking behaviour from the community. The Isiolo County Government should be aware that the main reasons for the persistent and frequent outbreaks of Kala-azar in the County are low community awareness of the disease in most areas, poor health seeking behaviour from the community, lack of collaboration from all the stakeholders in outbreaks response, limited staff and inadequate knowledge and skills on Kala-azar case management, poor diagnosis, long distances to the health facilities, weak surveillance systems, and inadequate resources for the management and control of the disease.

Conceivably, the community in Mataarba sub-location confirms the Kala-azar collaborative elimination efforts achieved by Bangladesh in October 2023 by becoming the first country in the world to be officially validated by WHO for having eliminated Kala-azar as a public health problem. This breakthrough was because of collaboration and dedicated efforts from the Government and many other stakeholders. The efforts focused on social mobilisation, integrated vector management, early diagnosis, effective disease surveillance, complete case management and operational research. These efforts are like some of the prevention and control strategies that Mataarba's community plans to undertake to address the problem of Kala -azar in the sub-location. At present, there is no reliable data on the prevalence of Visceral Leishmaniasis in the Country. This includes data on the burden, extent, and the risk factors of the disease.

The number of new cases vary annually because of poverty and malnutrition, environmental and climatic changes, social conflicts, forced displacements and population growth and migrations of populations. Each of these factors is the reason behind the emerging and reemerging outbreaks reported in the country and in Isiolo county. Optimal management of the disease is affected by the recurrent stock outs of the required commodities to manage the disease experienced in the country. In Isiolo county, only a few health facilities have the capacity to diagnose the disease with routine surveillance limited to passive case detection. It is apparent that there is need therefore for a paradigm shift in the control and prevention approaches, diagnostic and treatment procedures for Kala-azar to curb its spread to increasingly more areas in the country and in the county.

There is still more to be done to stem the incidences of Kala-azar in the neglected tropical disease high burden areas through research to help steer the country towards the elimination of the neglected tropical diseases using a multisectoral strategy intended to have broader benefit for health for all.

Ethical Approval

This was obtained from the Meru University of Science and Technology (MUST) Institutional Research Ethics Review Committee (MIRERC) and from the National Commission for Science, Technology, and Innovation (NACOSTI/P/23/29291). Additional approval was obtained from the Isiolo County Department of Health. Written and oral consent for participation in the study was obtained voluntarily from all the study informants prior to data collection.

Statement of Informed Consent

Written informed consent was obtained from the parent for the anonymized information on her children to be published in this article.

References

Abdullahi, B., Mutiso, J., Maloba, F., Macharia, J., Riongoita, M., & Gicheru, M. (2022). Climate change and environmental influence on visceral leishmaniasis in West Pokot county, Kenya (p. 2022.05.08.22274805). medRxiv. https://doi.org/10.1101/2022.05.08.22274805

Alvar, J., Den Boer, M., & Dagne, D. A. (2021). Towards the elimination of visceral leishmaniasis as a public health problem in east Africa: Reflections on an enhanced control strategy and a call for action. The Lancet Global Health, 9(12), e1763–e1769. https://doi.org/10.1016/S2214-109X(21)00392-2

de Souza, D. K., Picado, A., Bessell, P. R., Liban, A., Wachira, D., Mwiti, D., Matendechero, S. H., Bosch, M., Ndung'u, J. M., & Cruz, I. (2022). Strengthening Visceral Leishmaniasis Diagnosis Capacity to Improve Access to Care in Kenya: The Example of Marsabit County. Frontiers in Tropical Diseases, 2(January), 1–10. https://doi.org/10.3389/fitd.2021.809757

den Boer, M. (2021). Overcoming neglect. Finding ways to manage and control Neglected Tropical Diseases. 1–64. https://www.msf.ie/article/overcoming-neglect-finding-ways-manage-and-control-neglected-tropical-diseases

Dijk, N. van, Carter, J., Kiptanui, D., Mens, P. F., & Schallig, H. D. F. H. (2023). A Case-Control Study on Risk Factors for Visceral Leishmaniasis in West Pokot County, Kenya (2023110023). Preprints. https://doi.org/10.20944/preprints202311.0023.v1

Drugs for Neglected Diseases initiative. (DNDi, 2022). First oral drug for treating kala-azar to be ready by 2024. https://dndi.org/in-the-media/2023/dndi-first-oral-drug-for-treating-kala-azar-to-be-ready-by-2024/

Kanyina, E. W. (2020). Characterization of visceral leishmaniasis outbreak, Marsabit County, Kenya, 2014. BMC Public Health, 20(1), Article 1. https://doi.org/10.1186/s12889-020-08532-9

Makau-barasa, L. K., Ochol, D., Yotebieng, K. A., Adera, C. B., & Souza, D. K. De. (2022). Moving from control to elimination of Visceral Leishmaniasis in East Africa. August, 1–7.

Philipo Gwandi, M., Odongo, A. O., Kirira, P. G., & Jeruto, E. (2022). Risk Factors Associated with Leishmaniasis among Residents of Rural Marigat Sub-County, Baringo County - Kenya. International Journal of Tropical Disease & Health, 43(7), 1–11. https://doi.org/10.9734/ijtdh/2022/v43i730599

Ramanathan, K., Antognini, D., Combes, A., Paden, M. L., Zakhary, B., Ogino, M., MacLaren, G., Brodie, D., & Shekar, K. (2020). Planning and provision of ECMO services for severe ARDS during the COVID-19 pandemic and other outbreaks of emerging infectious diseases. The Lancet Respiratory Medicine, 8(5), 518–526. https://doi.org/10.1016/s2213-2600(20)30121-1

Wamai, R. G., Kahn, J., McGloin, J., & Ziaggi, G. (2020a). Visceral leishmaniasis: A global overview. Journal of Global Health Science, 2(1), 1–22. https://doi.org/10.35500/jghs.2020.2.e3

WHO. (2023). Leishmaniasis factsheet. https://www.who.int/news-room/fact-sheets/detail/leishmaniasis